

WHAT IS CLAIMED IS:

1 1. A sealed nickel-metal hydride storage cell,
2 comprising:
3 a positive electrode containing nickel as a positive
4 electrode active material;
5 a negative electrode containing a hydrogen-absorbing
6 alloy as a negative electrode active material, the negative
7 electrode having a theoretical capacity larger than a
8 theoretical capacity of the positive electrode so as to
9 provide a charge reserve capacity when the positive electrode
10 is in a fully charged state and to provide a discharge reserve
11 capacity when the positive electrode is in a fully discharged
12 state, a ratio of the charge reserve capacity to the discharge
13 reserve capacity ranging from 1 : 0 to 1 : 0.5;
14 a separator interposed between the positive electrode
15 and the negative electrode; and
16 an electrolyte immersing therein the positive
17 electrode and the negative electrode.

1 2. A sealed nickel-metal hydride storage cell according
2 to Claim 1, wherein the storage cell is overcharged during
3 initial charge.

1 3. A hybrid electric vehicle comprising a plurality of
2 sealed nickel-metal hydride storage cells, each of the
3 storage cells having:
4 a positive electrode containing nickel as a positive
5 electrode active material;
6 a negative electrode containing a hydrogen-absorbing
7 alloy as a negative electrode active material, the negative

8 electrode having a theoretical capacity larger than a
9 theoretical capacity of the positive electrode so as to
10 provide a charge reserve capacity when the positive electrode
11 is in a fully charged state and to provide a discharge reserve
12 capacity when the positive electrode is in a fully discharged
13 state, a ratio of the charge reserve capacity to the discharge
14 reserve capacity ranging from 1 : 0 to 1 : 0.5;
15 a separator interposed between the positive electrode
16 and the negative electrode; and
17 an electrolyte immersing therein the positive
18 electrode and the negative electrode.

1 4. A hybrid electric vehicle according to Claim 3, further
2 comprising:
3 an internal combustion engine;
4 a generator driven by the engine to generate
5 electricity for charging the storage cells; and
6 a controller that controls the engine and the generator
7 to recharge the storage cells.

1 5. A hybrid electric vehicle according to Claim 4, further
2 comprising a charge state detecting unit that detects states
3 of charge of the respective storage cells,
4 wherein the controller controls the engine and the
5 generator in such a manner as to keep an average value of the
6 states of charge of the storage cells at 55% or higher.

1 6. A hybrid electric vehicle according to Claim 4, further
2 comprising a voltage sensor to detect terminal voltages of
3 the respective storage cells,
4 wherein the controller controls the engine and the

5 generator in such a manner as to keep the terminal voltages
6 of the storage cells at 1.15 V or larger.

1 7. A hybrid electric vehicle according to Claim 3, wherein
2 the storage cells are overcharged to substantially equal
3 states during initial charge.

1 8. A hybrid electric vehicle, comprising:
2 an internal combustion engine;
3 a battery module having a plurality of nickel-metal
4 hydride storage cells, each of the storage cells having
5 positive and negative electrodes containing nickel and
6 hydrogen-absorbing alloy, respectively, as
7 electrochemically active materials, a separator disposed
8 between the positive and negative electrodes and an
9 electrolyte immersing therein the positive and negative
10 electrode, the negative electrode having a theoretical
11 capacity larger than a theoretical capacity of the positive
12 electrode so as to provide a charge reserve capacity when the
13 positive electrode is in a fully charged state and to provide
14 a discharge reserve capacity when the positive electrode is
15 in a fully discharged state, the discharge reserve capacity
16 being smaller than charge reserve capacity;
17 a generator driven by the engine to recharge the storage
18 cells;
19 means for detecting states of charge of the respective
20 storage cells; and
21 means for controlling the engine and the generator to
22 keep an average of the states of charge of the storage cells
23 at a given value or higher.

1 9. A hybrid electric vehicle according to Claim 8, wherein
2 the given value is 55%.

1 10. A hybrid electric vehicle according to Claim 8, further
2 comprising means for detecting voltages of the respective
3 storage cells,

4 wherein the controller controls the engine and the
5 generator to keep the voltages of the respective storage cells
6 at a discharge voltage limit or higher.

1 11. A hybrid electric vehicle according to Claim 10,
2 wherein the discharge voltage limit is 1.15 V.

1 12. A hybrid electric vehicle according to Claim 8, wherein
2 the storage cells are overcharged during initial charge.

1 13. A hybrid electric vehicle according to Claim 12,
2 further comprising means for approximately equalizing the
3 states of charge of the storage cells during initial charge.